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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/584,853

06/28/2006

Matteo Cherchi

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EXAMINER

RAHLL, JERRY T

ART UNIT

PAPER NUMBER

2874

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/584,853	<b>Applicant(s)</b> CHERCHI ET AL.	
	<b>Examiner</b> Jerry T. Rahl	<b>Art Unit</b> 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-19 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/28/06;9/16/09</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statements submitted on June 28, 2006 and September 16, 2009 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

### ***Drawings***

2. The drawings submitted have been reviewed and determined to facilitate understanding of the invention. The drawings are accepted as submitted.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 11-19 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 6,396,984 to Cho et al.

5. Regarding Claim 11, Cho describes an optical mode converter comprising a coupling waveguide (304) having at an input end ( $W_{Li}$ ) a first effective refractive index, the coupling waveguide comprising a tapered core (Fig 5A) of a substantially constant refractive index with a substantially square cross section (Fig 4) at the input end having a size that tapers down moving away from the input end, the coupling waveguide having a cladding (302) at least partially surrounding the tapered core; and a receiving waveguide (308) having a second effective refractive index at an output end, comprising a core of a substantially constant refractive index

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greater than the refractive index of the tapered core of the coupling waveguide, and a cladding (310) at least partially surrounding the core, a side surface of the tapered core of the coupling waveguide being optically in contact (Col 5 Lns 7-18), in a coupling portion thereof, with the receiving waveguide so as to allow optical coupling between the coupling waveguide and the receiving waveguide (Fig 4a-4c).

6. Regarding the further limitations of Claim 11 and the limitations of Claims 12-14 and 16, Cho is silent as to the relative refractive indices of the waveguides. However, when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (see MPEP § 2112.01). As discussed above, Cho describes the claimed mode converter structure. Therefore, the claimed relative refractive index properties are presumed to be inherent.

7. Regarding Claim 15, Cho describes the core of the receiving waveguide is tapered over at least a portion that is optically in contact with the coupling portion of the coupling waveguide (Figs 3, 5).

8. Regarding Claims 17 and 18, Cho describes and a launching optical fiber waveguide coupled to an input end of said coupling waveguide (Col 5 Lns 30-35).

9. Regarding Claim 19, Cho describes a method (see Figs 7a-7g) for fabricating an optical tapered waveguide comprising the following steps: growing a bottom cladding layer (702) on a substance (700); digging a wedge shape with a predetermined depth into said bottom cladding layer (Fig 7c); filling said wedge shape with an optical transmissive material (708) having a refractive index so as to form a wedge; growing a receiving core (714) above said wedge in a way to optically contact at least partially said core layer with an upper surface of said wedge; and

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growing a top cladding layer (716) on said receiving core. Cho is silent as to the relative refractive indices of the waveguides. However, when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (see MPEP § 2112.01). As discussed above, Cho describes the claimed mode converter structure. Therefore, the claimed relative refractive index properties are presumed to be inherent.

***Allowable Subject Matter***

**10.** Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**11.** Claim 20 describes a step of growing a ridge on the top of the cladding layer. This is subject matter not described or reasonably suggested, in conjunction with the further limitations of the present claims, by the prior art of record.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry T. Rahll whose telephone number is (571)272-2356. The examiner can normally be reached on M, W-Sa (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Uyen-Chau Le can be reached on 571-272-2397. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerry T Rahl/  
Primary Examiner, Art Unit 2874